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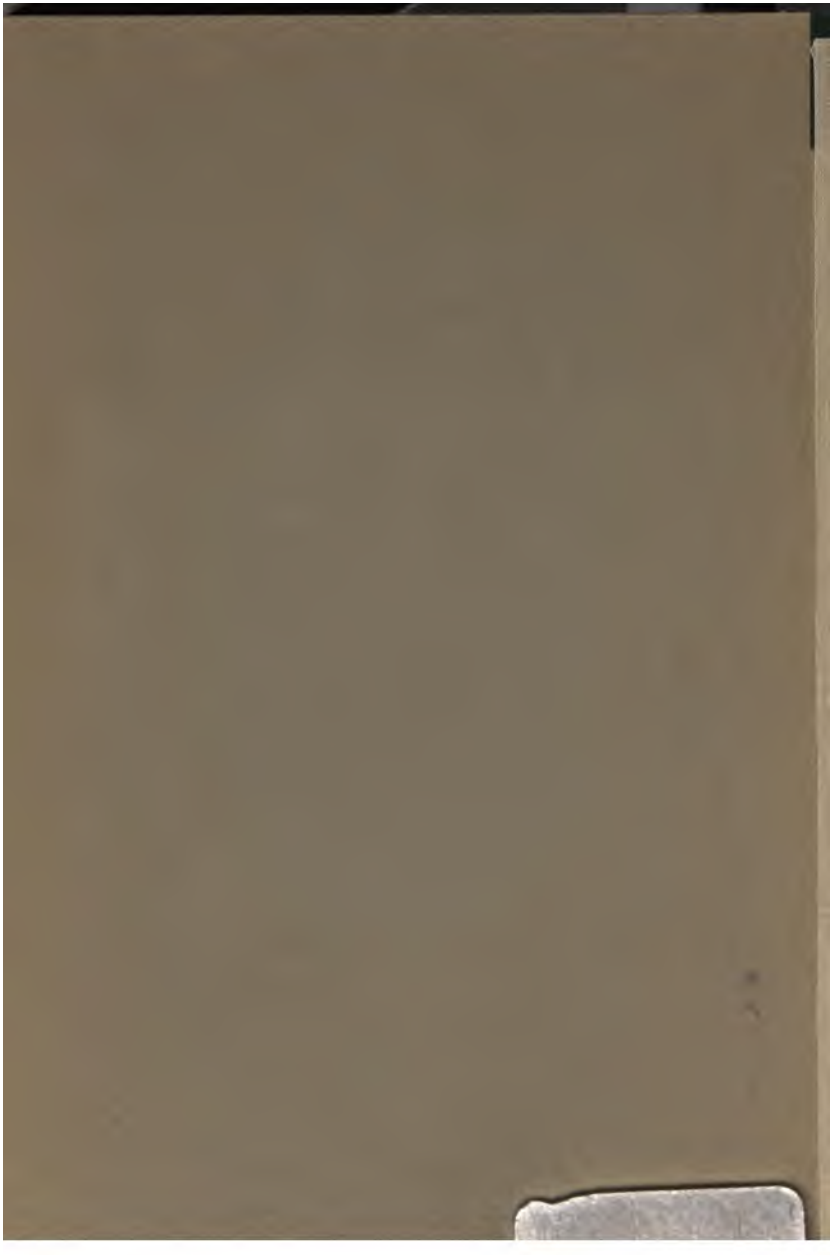

UNFERMENTED WINE

A FACT.

A REVIEW OF THE LATEST ATTEMPT TO SHOW THAT THE EXISTENCE OF UNFERMENTED WINE AMONG THE ANCIENTS WAS IMPOSSIBLE.

NEW AND REVISED EDITION.

BY

NORMAN KERR, M.D., F.L.S.,

LONDON.

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NEW YORK:
National Temperance Society and Publication House,
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PREFACE.

IN issuing a new Edition, which has been urgently called for, the Author has thankfully to acknowledge the candor with which the Press has very generally conceded that he has demonstrated both the possible and actual existence of Unfermented Wine among the Ancients. The main object of his labor has been achieved; the eminent philanthropist, to meet whose objections (founded on Mr. Wilson's book) the pamphlet was written, being now an ardent total abstainer. And several of the most distinguished scholars in the country have, after a critical examination, admitted to the Author their conviction of the soundness of the position contended for in the pamphlet.

NORMAN KERR.

42 GROVE ROAD, REGENT'S PARK,
LONDON, N. W.
January, 1879.

UNFERMENTED WINE A FACT.*

BY NORMAN KERR, M.D., F.L.S.

IT has happened more than once that an intellectual and sober atheist has pointed out to me certain passages in the Sacred Scriptures where wine is spoken of with approval, and has triumphantly asked me, "Can a book be true, or can its asserted Inspirer be infallible, when in it liquids which you, a man of science and a medical practitioner, know to be artificial poisons, are explicitly commended and unstintingly approved of?" My reply has ever been:

1. That believers in the Bible and in its Author, who are acquainted with the fact, a fact beyond dispute, that alcohol is a poison, and, therefore, that all alcoholic liquors are poisonous, are absolutely certain that the Inspired Volume can not possibly sanction the use of intoxicating beverages;
2. That wine is a generic name applied alike to fermented and unfermented, alcoholic and non-alcoholic, poisonous and innocuous, drinks, as is the word table—by which general description we may refer to loo tables, dining tables, card tables, work tables, or billiard tables, or

* Wines of the Bible—Rev. A. M. Wilson. London: Hamilton, Adams & Co.

to tables made of such differing woods as deal, mahogany, rosewood, or walnut;

3. That the Ancients indulged in both intoxicating and unintoxicating drinks;
4. That the wines mentioned in the Bible comprised both kinds;
5. And that the particular kind of wine referred to in any particular text must be determined by the context.

This has always, till recently, been accepted as a conclusive reply, and it does seem unanswerable.

(*Note.*—I purposely refrain from going beyond the accepted translation at present, as I have met with no similar argument drawn from the various Hebrew words rendered by the common name of wine in our English Bible).

A few months ago, however, I was met by the rejoinder, "Your reply is complete if only it were true. A dissenting minister has written a book, and two distinguished nonconformist divines have publicly declared he has demonstrated in that book, that it was quite impossible for the Ancients to have preserved wine unfermented and unintoxicating."

I could but reply that a dissenting minister might as well have written a book, and the two distinguished nonconformist divines might as well have declared he had demonstrated in that book, that no man-child had ever been born in England with a nose on his face. I knew that I was born with a nose, because I could see it and feel it, and I knew that wine could be preserved unfermented and unintoxicating, because I had it and drank it—in moderation.

I am happy to say that my skeptical friend both

saw and quaffed the generous and God-given unintoxicating wine (vintage of 1873), and together we drank confusion to the three eccentric theologians who, to their own satisfaction, had proved that we could not possibly do so in any old unfermented blood of the grape.

Having little leisure, and knowing that no one could prove *faits accomplis* to be impossible, for—

> "Facts are chiels that winna ding,
> And downa be disputed,"

I thought no more of the book, or of the reverend demolishers of fact, till, not long since, I found an earnest and intelligent Christian philanthropist conscientiously objecting to total abstinence, on the ground that Mr. Wilson had proved the preservation of unfermented wine by the Ancients to be impossible, and, therefore, that the Bible sanctioned the use of intoxicating liquors.

In deference to my friend, and from finding since that this book had been extensively quoted by Christians against the teetotal movement, and by infidels against the Bible, I have read the whole volume with care and attention, and have found the entire argument based upon a misunderstanding of popular chemical deliverances, a misunderstanding which could never have arisen had the author been skilled in organic chemistry or practically acquainted with many Eastern and Southern wines, of whose existence he seems to have been quite unaware.

Rev. Mr. Wilson's Position.

The author says (p. 88), that fermentation is immediate on exposure of grape juice to air, and, therefore, "it must have been simply impossible for the Ancients to have preserved their juice liquid and unfermented unless they had boiled it in air-tight flasks, or had expressed it in an atmosphere of hydrogen and carbonic acid, or had subjected it to a steaming process, and preserved it *in vacuo*. But they trode their grapes in an open wine-press, and pressed out the juice in an open vat, in the open air, so that fermentation was inevitable."

Dr. Norman Kerr's Answer.

I.—FERMENTATION NOT IMMEDIATE.

Fermentation is *not* immediate on exposure of grape juice to the atmosphere. It sometimes begins in a few hours, sometimes not for days (Geo. Sutton, F.L.S., Cult. of Grape Vine, p. 79; Dr. Ure, F.R.S., Dict. of Arts, 6th ed. iii. 1070; Watts, Dict. of Chem. ii. 628; Lond. Ency., Art. Wine, xx. 644; Penny Cyc. xxvii. 459). Grape juice, freely exposed to the air of my dining-room, mean of 60 deg. Fah., in March, 1878, did not ferment for four and a half days.

Till fermentation begins the wine is not alcoholic, not a trace of alcohol being found on application of even the most delicate tests. This is proved by the following analysis, in tabular form, extracted from that standard authority on chemical science, Watts' Dictionary of Chemistry (2d Supp. i. 520). The table refers to the fermentation of the white wine of Lam-

pertzloch—the must, or unfermented grape juice, having been taken and strained off from the stalks, skins, and stones—and shows the constituents of the wine both before and after fermentation:

	Weight of Must Grams.	Sugar by Copper Test. Grams.	Acid Grams.	ALCOHOL Grams.
Before Fermentation..	9,715·5	1,688·46	39·74	NONE.
After Fermentation....	8,955·0	traces.	47·82	781·41
Difference...	—760·5	—1,688·46	+8·08	+781·41

Thus, after fermentation there was no sugar, but a quantity of alcohol, while before fermentation there was a quantity of sugar, but NO ALCOHOL.

With a view to absolute accuracy, an enthusiastic and able chemist (my friend, Mr. T. A. Clifford) and myself have carefully verified this and all the other analyses and scientific conclusions in this *brochure*. We have performed an immense number of experiments under every conceivable condition, favorable and unfavorable, and we have rigidly excluded all doubtful or imperfect results, no matter how minute the doubt or imperfection might be.

To show how uncompromising we have been, I may add that two specimens of very good unfermented wine were laid aside altogether because we detected faint traces of alcohol, though in both cases the infinitesimal amount present in the wines was clearly owing to the intrusion, through an accident, of yeast germs.

In my own house I had, at first, considerable difficulty in getting grape juice to ferment at all, there being no *torulæ* about; but after an importation of

foreign yeast to hasten fermentation, we lived in so "infected an atmosphere" (Tyndall, Lecture at Royal Institution), that the difficulty was to keep every organized substance from fermenting. It was nearly five days before the first supply of freshly-expressed must fermented, but now in three days active fermentation sets in.

Our author has either knowingly perverted or unknowingly confused the application of the word "fermentation." As he is a Christian minister and an earnest social reformer, I can not believe for a moment that the former is the case, and can, therefore, come to no other conclusion than that he has erred through ignorance. Nor is it difficult to see how, from unacquaintance with scientific experiment and language, he has misunderstood and unconsciously misrepresented Liebig, Lees, and others in the use of the statement that "fermentation begins immediately on exposure to the air."

The word "fermentation," like the word "wine" in the Bible, is a general term, the particular signification having to be elucidated from the context. The term *is sometimes applied*, in an enlarged sense, to the whole series of changes taking place in vegetable juices, beginning with ripening *in* the fruit ("a long fermentation in the uncrushed cluster serves to dissolve the coloring and astringent matters more completely," Prof. Bouchardat On the Wine of St. Raphael, Lond., 1878, p. 9; "the clusters are left to dry, and a fermentation takes place which robs the watery parts," Ibid., p. 9, Translator's note), and ending in putrefactive fermentation after expression *from* the fruit. *At other times* the word is used to denote

that change of the principles of organic bodies which begins as soon as their vital functions have ceased, and, unless resisted, brings about resolution into their original elements (Nicholson, Chem. p. 457; Liebig's Letters, 2d series, p. 129; Watts, ii. 624).

The term is, however, *usually* employed in science to indicate such special processes as—

1. The *alcoholic or vinous* fermentation, that accompanied by the formation of alcohol, and with which alone this controversy and the temperance movement have to do;
2. The *acetous* fermentation, that accompanied by the formation of vinegar (Watts, ii. 628); and
3. The *lactic* fermentation, that by means of which milk sours and curdles (Prof. Lister, Int. Add., King's Coll., 1877–78).

The falsity of Mr. Wilson's premise—and on this false premise nearly the whole of his argument against the possible ancient existence of unintoxicating wine is based—is very plainly seen when we compare the fermentation of grape juice with the fermentation of milk, the two fermentations being analogous.

In the one grape sugar is decomposed by the ferment *torula* or *saccharomyces cerevisiæ* (Huxley and Martin, Prac. Biol., 3d ed., p. 1; "the alcoholic ferment or yeast is a minute cellular plant," Ency. Brit., 9th ed., Art. Alcohol, p. 470; "the so-called yeast or ferment, a plant which lives upon sugar," Williamson, Chem., new ed.; "as certainly as the vinous fermentation is set up by the yeast plant," Brit. Med. Jour. lead. art. No. 903, p. 579, 20th Apr., 1878); *in the other*, sugar of milk is decomposed by the ferment *bacterium lactis* (Lister, ibid.; Brit. Med. Journ., ibid.)

The fermentation of both the animal and vegetable substances begins in the same way; in both it can be prevented or checked by similar precautions (Liebig, Letters on Chem., 3d ed., p. 224); and, allowed to proceed, in both it ends in putrefaction (Liebig, ibid., 2d ser., p. 132:—"the fermentation of vegetable juices and the acidulation and coagulation of milk both belong to one and the same class of phenomena").

Momentary contact with the organic germs in the air sets up the same series of changes in each liquid, so that if juice freshly expressed from the grape be called fermented, so also must milk newly drawn from the cow. In other words, milk which we know to be sweet must be said to be sour.

The series of changes which, unchecked or unhindered, ends in the putrefaction of a mutton chop, has been described by Liebig as a process of decay, and if it be correct to designate *must* before the vinous fermentation has set in as a "fermented wine," we can not avoid speaking of the fresh and juicy specimen of animal flesh that we, as Englishmen, delight in, as a "putrid chop."

In ordinary language fermented beverages mean alcoholic or intoxicating beverages, as in Sir Henry Thompson's celebrated letter to the Archbishop of Canterbury, in 1873, where he speaks, in one sentence, of the habitual use of "fermented liquors," and, in another, of the ordinary and daily use of "fermented drink," as productive of much mental and bodily mischief.

It would be as accurate to say that a house is burning because it is built of a combustible wood as to say

that vegetable juice is fermenting because it contains fermentable materials. The combustible wooden house has the power of combustion, and the fermentable juice has the power of fermentation; but till the one *is or has been on fire* we can not call it a burning or a burnt house, and till the other *is or has been working* we can not speak of it as a fermenting or fermented liquor.

In this paper, as in scientific records generally, and in common speech on any point relating to an intoxicating liquid, the words "fermentation," "fermenting," and "fermented" are therefore to be understood as referring to the alcoholic or vinous fermentation alone, unless some other fermentation be specifically named, or the term be employed evidently in a general sense.

Is more evidence needed to prove that fermentation does *not* take place immediately on exposure to the air? Then listen to Liebig: "The juice of grapes, and vegetable juices in general, become turbid when in contact with the air *before* fermentation commences" (Chem. of Ag. and Phys., Playfair & Gregory, 4th ed., p. 327); to Cyrus Redding, the well-known writer on wines, who speaks of the use of sulphur matches to *prevent* fermentation (Hist. and Des. of Mod. Wines, p. 44); to Drs. Thudicum and Dupré, the standard authorities on viniculture and wine manufacture, who refer to the adjustment of acidity and sugar to be made in *must* "before it is allowed to ferment" (Orig. Nat. and Use of Wine, p. 116); and to Sutton, "the must or juice is pressed from the vintage, and before it has time to ferment it is put into casks" (p. 163).

Further, in the identical words of a host of authorities, "Juice, when newly expressed, and before it has time to ferment, is called must, and in common language sweet wine" (Ure, p. 823; Lond. Ency. xx. 645; Pop. Ency. vii. 88; Am. Cyc. vii. 142).

If authoritative official evidence that fermentation does not begin immediately on exposure to air be desired, we have it in the following extract from the Inventory of the Food Collection of the Science and Art Department of the Committee of Council on Education, p. 106: "The wines of Europe are mostly made from the juice of the grape, which, *before* fermentation, is called must."

II.—HOW TO PRESERVE WINE UNFERMENTED.

The Ancients could easily, as many wine cultivators do at the present day, have preserved their wine unfermented and non-alcoholic by several simple processes. Let me describe some of the ways in which this can be done:

A.—COLD.

Fermentation does not take place at a temperature below 40° Fahrenheit (W. A. Miller, F.R.S., El. of Chem., 4th ed.; Am. Cyc. vii. 143). Nearly all processes of fermentation, if not all, cease at about 41° Fahrenheit (Bastian, Jour. Lin. So. Zo. xiv. 73, p. 6). If the juice be kept at the former temperature it would therefore not ferment; and I have known a quantity kept in a cold cellar in Britain over a whole winter without a sign of fermentation. The requisite degree of cold to prevent fermentation could easily

have been attained by immersion of the unfermented fluid in a very cold well.

This method is thus described by my respected teacher, Professor Ramsay: "When it was desired to preserve a quantity of pure grape juice in the sweet state an *amphora* was taken and coated with pitch within and without; it was filled with *mustum lixivium* (wine pressed before the grapes were fully trodden), and corked so as to be perfectly air-tight. It was then immersed in a tank of cold fresh water, or buried in wet sand, and allowed to remain for six weeks or two months. The contents, after this process, were found to remain unchanged for a year, and hence the name of *aei gleukos*, or *always must*" (Smith, Dict. of Gr. and Rom. Ant., Art. Wine, p. 1202; Columella, b. xii. c. 29; Pliny, Nat. Hist. b. xiv. c. 9).

I quote the learned professor's account, as he occupied a leading position amongst the highest classical authorities of this century, and no one will question the accuracy of his translation. There can be no doubt as to the liquor just referred to having been unfermented, for Pliny says: "Id evenit curâ, quoniam fervere prohibetur: sic appellant musti in vina transitum"—"This comes about through care, forasmuch as fermentation is prevented: so they call the passage of must into wine" (Pliny, ibid.).

The modern application of this method of keeping wine unfermented and unintoxicating was thus detailed by Philip Miller, F.R.S., in 1768: "The way to keep wine long in the must is to tun it up immediately from the press, and, before it begins to work, to let down the vessels, closely and firmly stopped, into a well or deep river, there to remain for six or eight

weeks, during which time the liquor will be so confirmed in its state of crudity as to retain the same, together with its sweetness, for many months after, without any sensible fermentation" (The Gardeners' Dict., 8th ed., Art. Wine).

True history ever repeats itself, and as we follow Miller we seem almost to be reading in Columella or Pliny. Even if the transference of the fresh juice be conducted leisurely, in fact at any period before fermentation has set in, the wine will remain unfermented if the temperature of the water in which it is immersed be under 42° Fah., while, if the wine has not been immersed till fermentation has set actively in, the process will be at once arrested, and can not be resumed till the temperature be raised.

B.—HEAT.

(*a.*) *Below boiling point, with exclusion of air.*—Fermentation can not take place above 113° Fahrenheit (Miller, El. of Chem.), 140° Fahrenheit (Bast., ibid. xiv. 74, p. 66), so that pure grape juice, heated to many degrees below boiling point, if poured at once into a new bottle, made of the skin of goat or other animal, and the bottle be closely and tightly tied, will not ferment while kept in a tolerably dry atmosphere. Mr. Clifford and I heated a quantity of freshly-expressed juice to 180° Fah., being 32° below boiling point of 212° Fah., on 14th March, 1878, poured it, unstrained, at once into a new pig-skin, and tied the skin tightly close up to the contents. After this bottle had hung in a mean temperature of 54° Fah. for two months, in an atmosphere impregnated

with yeast germs, we carefully examined the juice and found no trace of alcohol.

(*b.*) *At boiling point, with exclusion of air.*—If unfermented grape juice be enclosed in an air-tight vessel and heated in boiling water, fermentation will be rendered impossible (Gmelin, Chem. by Watts, vii. 100; Watts, ii. 625). Wine must boiled and enclosed in a bladder does not ferment even if suspended in fermenting must (Helmholtz, xxx. 434; Watts, ii. 625; Gmelin, xv. 266).

(*c.*) *Below boiling point, with free exposure to air.*—Mr. Clifford and I heated grape juice daily to 185° Fah., or 27° below boiling point, leaving the vessel quite open in an atmosphere full of yeast germs, and, after five weeks, found the liquid totally devoid of alcohol.

(*d.*) *At boiling point, with free exposure to air.*—If pure juice of the grape be exposed once a day to a boiling heat, without being protected from the air, fermentation may be prevented for any length of time (Gmelin, vii. 100; Watts, ii. 625). Mr. Clifford and I boiled grape juice daily for one minute, and, though the air of the room was so full of germs that it was difficult to keep any organized material from fermenting, no alcohol was formed in the must so treated, though we carried on the experiment till all the juice was boiled away. We found no *torulæ* till twenty-four hours had elapsed after each boiling and exposure, and these were at once broken up and destroyed by the next boiling (Clifford and Kerr, 1878).

C.—INSPISSATION.

Grape juice boiled down to a half, a third, or a fourth of its bulk, does not ferment for a very long period, and then only slightly and on the surface. Three months ago I prepared specimens of these unfermented wines of the Ancients, *defrutum*, one-half evaporated (Plin. N. H. xiv. 9), and *sapa*, *siræum*, or *hepsema*, two-thirds evaporated (Plin. ibid.; Ramsay in Smith, Art. Vin.), and I have just finished using them. The blood of the grape was poured warm into ordinary glass bottles, which were sealed as wine bottles usually are, and it continued unfermented and free from alcohol to the last. And I had the pleasure, not long since, of enjoying a refreshing draught from a bottle of Eastern wine more than four years old, which I found, on chemical examination, absolutely non-alcoholic.

D.—EVAPORATION.

Evaporation, or perfect dryness, prevents every kind of fermentation (Watts, ii. 635; Gmelin, vii. 100). This was easily attained by the wine being put in large bottles and suspended in the chimney, called *fumarium*. "Liquids evaporate at temperatures below their boiling point" (Fownes' Chem., 10th ed., p. 46). The Oriental traveler, Mr. Buckingham (Travels among Arab Tribes, Lond. 1825, p. 137) was treated at Cufr Injey to cakes of wine, which he describes as a very curious article, probably resembling the dried wine of the Ancients, quite hard and dry, in shape like a cucumber, capable of being kept fresh and good for many months—a welcome treat at all times, and

particularly well adapted for sick or delicate persons who might require some grateful provision that could be carried in small compass without risk of injury on the journey. He also describes (p. 140) this dried wine as having the consistency of portable soup. Nor is solidity or perfect desiccation necessary, for fermentation demands a great degree of liquidity, taking place only when the solution is sufficiently diluted with water (Watts, ii. 630; Gmelin, xv. 268).

E.—PRESENCE OF MUCH SUGAR.

Miller says (El. of Chem., 4th ed., iii. 149), that a solution which contains more than a fourth of its weight of sugar can not be made to ferment. The results I have already obtained from an extended series of experiments, under very severe conditions, forbid me agreeing with Miller; but, even with large quantities of added yeast, I have found a point of saturation with sugar at which fermentation is completely checked. When a solution of grape sugar and water is taken, no foreign yeast being added to the mixture, and the liquid is left to ferment like ordinary grape juice, a proportion of sugar, under what has been known to occur in some musts, has prevented fermentation for weeks (Clifford and Kerr, May, 1878).

This research is not concluded; the conditions and extent of the experiments indispensable to the establishment of the actual power of sugar to prevent fermentation requiring months of careful and accurate observation; but this much we have arrived at, viz., that a certain proportion of grape sugar in vegetable juice greatly hinders fermentation.

F.—ANTISEPTICS.

By the addition of various substances organic fermentable bodies are deprived of their tendency to fermentation (Gmelin, vii. 100). The addition of sulphurous acid, or the modern salycilic acid, besides many other substances, arrests fermentation when begun, and prevents its onset (Watts, ii. 625).

A portion of fresh unheated grape juice was filtered through an antiseptic medium (tow washed with a mild solution of carbolic acid) on 4th April, 1878, and put up in a sealed bottle. More than one month thereafter, on 6th May, 1878, the bottle was opened and not a trace of alcohol could we find in the contents.

The antiseptic obstruction to fermentation would be greatly aided by the tanning of the skin bottles, outside and inside, with substances possessing antiseptic properties. (Watts, ii. 626: "the bottles are often filled with a strong infusion of oak bark to tan them," Gadsby's My Wanderings, ii. 342).

G.—DESTRUCTION AND EXCLUSION OF ORGANIC GERMS.

The *torulæ* in the atmosphere may be destroyed by passing the air through a red-hot tube (Schwann and Helmholtz), or over incandescent platinum wire, as Professor Tyndall has recently done. The germs may be prevented from entering into the wine vessels by filtration through cotton-wool, asbestos, tow, and similar substances (Schroder and Dusch; Ency. Brit., 8th ed., Art. Chemistry; Prac. Biol., Huxley and Martin, p. 1). The long narrow necks of the ancient wine

bottles, such as we see representations of in the British Museum, were peculiarly adapted for plugging in this fashion.

H.—SULPHURIZATION.

The easiest method is to fill the cask nearly full of the pure unfermented juice, then burn sulphur in the empty portion, and whilst the sulphurous fumes are present close the cask tightly. This is the plan preferred and usually adopted by wine-growers now, and they have no difficulty in keeping copious stores of this unfermented wine. Many wine-cultivators have a quantity of it always in stock.

"Not long ago," says my lamented friend, Professor James Miller, the eminent surgeon, "I made the acquaintance of an extensive wine-grower on the Moselle. 'Have you any unfermented wine-juice of the grape?' said I. 'Tons,' said he. 'How old?' 'Some of it fully ten years.' And then he went on to explain two modes of preserving it in its pure, natural, unfermented state: one by the boiling process, another by the sulphur cure—both precisely as practiced in olden times" (Nephalism, pp. 147, 148).

The process is exceedingly simple. The must is poured into barrels or bottles which have been strongly sulphured by the burning of sulphur matches. More matches are burnt from time to time, and the lid, bung, or cork is securely fastened (Thud. and Dupré, p. 396; Sutton, pp. 163, 164; Redding, 2d ed., p. 42). This must *never ferments* (Muspratt, Chem. II. 1119; Redding, p. 42; Sutton, pp. 163, 164).

Most of these numerous modes of preparing and

preserving unintoxicating wine could easily have been practiced by the Ancients, minute directions still extant evincing a practical acquaintance with several processes, both for the breaking of the strength of wine by filtration (and an effectual method repeated experiments have shown me filtration to be), and for the absolute prevention of fermentation. Therefore, as there was always a longer or shorter interval between exposure of grape juice to the air and the beginning of fermentation, the preservation of unfermented and unintoxicating wine seems to me as undeniable in those times as is the existence to-day of Mr. Frank Wright's similar wine prepared by modern scientific appliances.

This nineteenth century non-alcoholic wine (a bottle of which, taken at random out of my wine-cellar, where it has been for four years, was analyzed by Mr. Clifford and myself on 23d March, 1878, and found absolutely free from alcohol) I prescribe largely in the treatment of such diseases as fever, consumption, and that most depressing malady, dyspepsia, from one of the Protean forms of which Timothy may have suffered when he received the prescription of probably a like wine from the Apostle Paul.

Dr. Pereira speaks of grapes as allaying thirst and checking febrile heat, and as of great use in the inflammatory form of dyspepsia (Food and Diet, by Lee, p. 171).

THE WINE AT CANA.

We have no absolute knowledge of the nature of this wine, and can form an opinion of its properties only from the character of Him who wrought the miracle.

There is now no doubt as to the poisonous influence of alcohol. All authorities on toxicolgy agree on this, and the highest anti-abstaining authorities on viniculture, the friends, defenders, and improvers of wine manufacture (Drs. Thudicum and Dupré) admit that "alcohol is poisonous even in small doses." We know that it is, practically, the same alcohol which is the attraction of all intoxicating drinks, for the soothing anæsthetic influence of which all such drinks are taken; and we also know that the alcohol in beer, wines, and spirits is not changed in character and effects by the particular form in which it may be presented. ("We have not found a single physical or chemical property possessed by wine which is not in perfect harmony with the assumption that it contains the alcohol as a simple admixture, and not in any sort of combination,"—Thud. and Dupré, p. 159).

Therefore, it is patent that all alcoholic beverages are simply mixtures of poison and water, the melancholy proof of this being found everywhere in mental eclipse, increased disease, and shortened life. ("I know that alcohol is a most deleterious poison," Sir William Gull, Evidence before Lords' Committee).

This being the plain verdict of science and experience, can we entertain the thought that the Saviour of mankind, who gave His life to benefit man, would make and offer to any human being even the smallest quantity of that which is a poison to both body and brain? The very supposition is monstrous, and the slander, if blasphemy be not the appropriate term, is as groundless as it is gratuitous, as unjust as it is ungenerous.

WHEN SUCH ASPERSIONS ARE ALLOWED TO BE

THROWN UPON OUR SAVIOUR'S CHARACTER IN THE VERY HEART OF HIS VISIBLE CHURCH, CAN WE WONDER AT THE PREVALENCE OF MODERN ATHEISM?

Christ turned water into wine. What kind of wine? "Good wine." Yes, but intoxicating wine is bad wine and unintoxicating wine is good wine; so that the wine at the marriage at Cana must surely have been unfermented and unintoxicating. Looked at in this light, the miracle has a peculiar beauty and meaning; for, as St. Augustine, Bishop Hall, and others hold, He, at the marriage at Cana, wrought, in a moment, that miracle which He is working, though more slowly, every year—the conversion of the water (or sap) of the vine into wine in the grape.

NEW WINE IN OLD BOTTLES.

Mr. Wilson says (p. 178), "it is equally certain, from the reference to the bursting of the bottles, that both the old and new wines spoken of by our Lord must have been fermented liquors." Looking at this parable from the stand-point of science, I am driven to an exactly opposite conclusion.

The extensive force liberated by fresh grape juice, when undergoing fermentation, is enormous. A must, one-fifth sugar, develops forty-seven times its volume of carbonic dioxide, equivalent to a pressure of 34.3 atmospheres. This would be equal to 500 lbs. on the square inch, or ten times the pressure an ordinary high-pressure steam-engine has to withstand (Thud. and Dupré, p. 478).

That this immense pressure, which would result from the fermenting of unfermented juice, would burst bottles asunder was a phenomenon every one

could understand. Poured into new bottles, with very simple precautions to prevent fermentation, the juice would keep quiet and still and the bottles remain whole. But if the bottles had been previously used to contain any kind of fermentable materials, minute portions of albuminoid matter might be left adhering to the skins, and this would serve as food for the yeast germs from the air, and set up fermentation which would extend to the new unfermented contents with the speedy issue of a tremendous explosion.

It has been said by Mr. Wilson (*Christian News*, 23d March, 1878) that, besides the fermentation in the vat, champagne is fermented also in the bottles, many of which burst in the operation ("There was a constant succession of sounds [in the wine-cellar] as if from the discharge of small air-guns or pistols, which trembled through the vaults, succeeded by the sound of falling fragments of glass and flowing liquid." —Thud. and Dupré, p. 486).

But the pressure of this second fermentation in the bottle is trivial compared to what takes place during the first fermentation in the vat. Formerly it was 500 lbs., now it is only about 87 lbs. on the square inch when the breakage of the bottle sets in, the constant cannonade reminding one of moment firing in artillery practice.

The production of effervescing wines is of comparatively recent date, Dom Perignon, a monk of the abbey of Haut Villers, being acknowledged to have first invented them at the close of the seventeenth century (Thud. and Dupré, p. 473); but even if the modern elaborate manufacture of champagne had been carried

on in the time of our Lord, the bursting of bottles in this weak second fermentation would have been known only to those in the secrets of the trade.

And is it reasonable to suppose that He would clothe His teaching in an illustration which could be understood only by the initiated few, when He had the opportunity of employing symbols drawn from processes with which all in a wine-growing country like Palestine would be familiar?

It may be urged that in many fermented still wines there is a "fermentation" in the bottle. And so there is, but this is an insensible fermentation—*i. e.*, it is not evident to the senses, as is the effervescence of the first or active fermentation. This is a silent and invisible process (Ency. Brit. 8th ed. xxi. p. 889), having to do with the ripening, odor, flavor, color, and bouquet of wines (Penny Cyc. xxvii. 460). Here there is no expansive force, consequently no pressure and no bursting of bottles therefrom. We may, therefore, dismiss this "fermentation in the bottle" as quite inapplicable, there being no bursting or breaking of bottles in the process, which sometimes extends over fourteen years.

In justice to Mr. Wilson, it is only fair to give his contention that the old bottles were so frail as to be unable to endure the expanding force of the new wine, even "when open to the air of heaven." But this theory can not have even the shadow of a claim to our consideration unless it can be shown that the Ancients were in the habit of *leaving their bottles open.*

We know that the Moderns do nothing of the kind, and it is difficult to see any reason for so remarkable

a procedure, all wine spoiling when kept in open vessels. Fermentation went on amongst the Ancients in dolia, or earthenware vessels, in hot climates, and in hooped tubs of wood in cold climates, and these were uncovered (Smith, Dict. of Gr. and Rom. Ant., p. 1202); but after fermentation had changed the must into fermented wine and had subsided, the wine was drawn into amphoræ or other vessels, which were stoppered tight by a plug of wood or cork rendered impervious to air by being smeared over with pitch, clay, or gypsum. The wine was transferred to leathern bottles for convenience of transportation, when, of course, the bottles must have been tightly closed (Ibid.)

It is self-evident, too, that skin bottles placed in the fumarium must have been closed, or the wine would have been ruined by the absorption, to saturation, of the smoke.

All authorities on Bible times describe the skins of animals, when used for holding wines—and this is known to all familiar with Eastern manners and customs—as having the openings at the feet and neck either tied up permanently, or so that one could be used for pouring out the contents (Calmet, Dict. of Bible, by Taylor, Art. Vine, p. 878), and there is really no foundation for the assertion that the frail old bottles were "open to the air of heaven"; but if leathern bottles had been open and uncorked there could have been no sensible distention of them during even the most active fermentation, for the gas would have escaped as fast as it was generated.

The only remaining hypothesis on the fermented basis is that "Christ refers to the excessive weakness,

through the age, of bottles." But this explanation deprives the language of our Saviour of all its peculiar force and fitness.

Skin bottles are used for many liquids besides wine. The Greeks still take milk to market in them, and travelers in the Holy Land have seen olive oil carried in similar bottles (Gadsby, ster. ed., ii. 342). In Damascus, Mr. Buckingham saw men going about the streets with skins of iced water sweetened, and retailing the refreshing beverage at a very cheap rate (Trav. among Arab Tribes, p. 353; Knight, Ill. Com., i. 447). Baron Tavernier says that in Ispahan men go about with a boracho full of water, and a glass, and a bag full of ice (Persian Trav., London, 1628, bk. iv., p. 149).

Water was in more general use in the East than wine, and if Jesus had desired to employ the figure of the bottles being unable through sheer frailty, "worn out in the service," to hold the liquid poured into them, would He not have specified water rather than wine? Surely, if He had been referring to the inability of the bottles, through excessive wear and tear, to retain their contents. Besides, old bottles, though quite unfit to receive new wine, by the fermentation of which they would be so liable to burst, might still be serviceable for other purposes—such as the carrying of dried substances, not easily breakable, and which would thus be preserved from wet, dust, and insects (Calmet, Art. Vine, p. 878).

Unless the parable alludes to the phenomenon of unfermented wine fermenting, and, in consequence of the enormous pressure of the gas given off during fermentation, bursting old bottles in which fermenting

matters were present, the simile seems to me neither apposite nor suggestive.

Were the teacher a modern visionary, illiterate and irrational, I would be ashamed to do him the injustice of supposing that he would deliberately employ an obscure and pointless illustration when one most clear, most striking, and most forcible was present to his own and his auditors' intelligence. And what right have we to assume that He who was perfect and divine, and who spake as never man spake, would exhibit less clearness of perception and less aptness of illustration? Nothing can be plainer than our Lord's words, "No man putteth new wine into old bottles, else the new wine will burst the bottles and be spilled, and the bottles perish."

Judging His teaching by the standard we apply to that of erring man, it seems to me that we can come to no other conclusion than that the wine He spoke of as causing old bottles to burst must have been, when poured into the bottles, unfermented and unintoxicating.

WINE OF THE PASSOVER.

Our author contends (pp. 340, 341), that the wine of the Passover must have been fermented. Into his theological and exegetical reasons for this belief I decline to enter. All that is needful for me to do is to show that the ancient Jews could have had ample supplies of unfermented wine wherewith to celebrate this sacred festival.

I.—Unfermented wine could have been kept in many different ways, as we have already seen.

II.—The Ancients could have prepared unfermented wine all the year round without employing any of the numerous means of preserving it in a liquid form. I have frequently eaten grapes in excellent preservation eight to nine months old, and a friend of mine now in Britain not long since unpacked grapes he had received eleven months previously from the Continent, finding them fresh and good.

The harvest of grapes, when they are ready for plucking, extends over nearly four months, so that even if they could be kept no longer than a little more than eight months, there could have been no difficulty in expressing new unintoxicating wine whenever required. In point of fact, however, the fruit can be kept in the cluster throughout the year, and from this new unfermented wine can be made at any time.

A traveler in Italy (Mr. E. C. Delavan, 1839) speaks of a large basket of grapes as having been sent to him in the month of January, which were as delicious and looked as fresh as if recently taken from the vines, though they had been picked for months. Mr. Delavan adds that a friend of his, one of the largest wine manufacturers in Italy, told him that unfermented wine could be made any day in the year, and showed him, for table use till next vintage, a quantity of grapes sufficient to make 100 gallons of wine (Stand. Temp. Lib., 1843).

The preservation of the grape for lengthened periods, in a natural and fresh state and with flavor unimpaired, is well known to all familiar with the growth and manufacture of wine. The fruit may be preserved in dry airy storehouses, care being taken to

keep the bunches far enough apart; and we see grapes sold here now, eight or nine months after being gathered from the vine, transported from the Continent and kept packed in sawdust or cotton as 200 years ago they were sent from Persia to India wrapped in cotton, and there sold throughout the year (Bernier, Travels in Mogul, Lond., 1826, i. 284).

That new wine, freshly expressed from the grapes, was in common use among the Easterns, either by itself or mixed with water, is indisputable. Knight, commenting on Genesis xl. 11, "I took the grapes and pressed them into Pharaoh's cup," says that wine [fermented] could not be the result of this process. The juice was no doubt mixed with water. The Orientals are still very fond of such drinks, formed by mingling the juices of fruits with water. "Such beverages stand to them in the place of fermented or distilled drinks to Europeans. This drink *could not be intoxicating*" (Ill. Com., i. 102).

III.—Unfermented wine could be prepared at any time by either steeping dried grapes in cold water overnight, or by pouring hot water over the fruit for the immediate preparation of the wine. That in Bible times grapes were often preserved dry is proved by the frequent mention of them in the sacred writings: ("Then Abigail made haste and took . . . . 100 clusters of raisins."—1 Sam. xxv. 18; "Ziba . . . . met him [David] . . . . with 100 bunches of raisins." —2 Sam. xvi. 1). Now, raisins are simply grapes dried, or, in other words, freed from the water they contained, and, as we have already seen, evaporation to dryness is an effectual preventive of fermentation.

The natural qualities of the fruit are quite restored on the absorption of water by the dried berries, and thus raisin wine is a perfect specimen of an unfermented and unintoxicating drink.

Accordingly, we find from abundant evidence that many ancient and modern Jews have employed this wine at the Passover. In proof of the general practice of the most orthodox modern Jews, it is sufficient to quote the Encyclopædia Britannica, "The Rabbins would seem to have interpreted the command respecting ferment as extending to the *wine* as well as to the *bread* of the Passover. The modern Jews, accordingly, generally use raisin wine after the injunction of the Rabbins" (8th ed., Art. Pass., p. 333).

One of the most distinguished philanthropists of the present day, the well-known editor of various popular and fascinating religious periodicals, was recently on a visit to a Jewish friend. When the Passover season began the host said to his guest, "You must drink four cups of wine." "What?" said the guest, an uncompromising abstainer, "I can not drink wine on any pretence." "O yes, you can," was the reply; "our wine is unfermented and unintoxicating, it is prepared quite fresh from dried grapes, and you may drink of it with a clear conscience."

The *London Echo* newspaper of 17th April, 1878, says, that "the wine of the Passover is usually the liquor from raisins boiled in water." "Red wine, but *unfermented*, was used in the Passover" (Very Rev. Barnett-Clarke, M.A., Dean of Capeton, Temp. Rec., Mar. 21, 1878).

Nor has the use of unfermented wine at solemn festivals been confined to the Jews By many Ar-

menian, Coptic, and Nestorian churches wine containing alcohol was avoided in their religious services. For many centuries the Christians of St. John in Persia, of St. Thomas in India, and of the Abyssinian Church have used unfermented wine (the Dean of Capeton, ibid.) *Speaking of the communion wine*, the Bishop of Jerusalem (Gobat's Jour. in Abyssinia, Lond., 1834, p. 345) says, "The wine is the juice of dried grapes, with water"; and again (p. 223), "wine, which is raisin juice and water."

Referring to the Greek Christians in Moscow, Macarius, Patriarch of Antioch, A.D. 1764, says that they do not drink anything intoxicating in Lent; and, regarding borsh, a vinegary beverage made sometimes from grain and sometimes from honey-water, he adds, "as being intoxicating, they do not drink it in the time of Lent" (Travels by Belfour, ii. 41).

SOBHE, OR SOVEH, A BOILED WINE (LEES).

Mr. Wilson is wondrously sarcastic and merry at the very idea of eating and drinking the same substance; but a moment's reflection would have recalled to mind many products which are used in both ways.

Let Olearius answer him: "The Persians sometimes boil the duschab (a syrup of sweet wine or must) so long that they reduce it to a paste for the convenience of travelers, who lay in a stock of it for the journey, cutting it with a knife, and diluting it with water to serve as a drink" (Travels in Muscovy, Tartary, and Persia, by Adam Olearius, Ambassador for Holstein, by Wicquefort, lib. v. 802).

Some contend that, granting boiled-down honey of

grapes, which Mr. Wilson contemptuously designates "grape jelly," to be unfermented wine, it is something entirely different after the dilution with water, which it requires in order to be drunk as a beverage, from what it was when first prepared in the state of unfermented grape juice. This is incorrect. By evaporation all that is driven off from the juice of the grape is water, the original properties of the juice being unimpaired, and the dilution with water only brings the juice into its former fluid form.

As Olearius adds, "One can reduce five hogsheads to one, say some chemists, and, amongst others, the celebrated M. Glauber, by boiling the sweet wine or must down to a fifth part, because there is no apparent sign that the wine loses the character it possessed before it was boiled; and, after that, by adding as much water as was evaporated, one could restore it to the same quantity and give it the same goodness as it formerly had" (Olearius, ibid., lib. v. 802, 803).

Thus, then, the dibs, or dipse, often called in Smyrna balmetz (honey of grapes), which Mr. Wilson scornfully brands as "molasses," is really and truly a thickened or partly solidified wine, possessing all the original, sustaining, and exhilarating properties of the grape, and at once convertible by the simple addition of water into a fragrant and attractive beverage. I confess to a strong liking for this most pleasant and useful article of food and drink, and am in the habit of enjoying it in both forms—at one time eating it like butter or honey to porridge or bread, and at another drinking it with as keen a relish as I formerly sipped fine old port, and never doubting that this boiled grape juice has as much right to the name of

"portable wine" as the soup cakes now sold by every grocer have to the name of "portable soup."

But if we even, for the sake of argument, concede to our author that this semi- or wholly-solid juice is not entitled to be called wine, we have not yet done with his dissertation on sobhe. Let me call attention to a remarkable instance of his unacquaintance with many of the facts regarding wines. At p. 277 he says: "If soveh is the designation of boiled grape juice, ... the boiled juice must have been either a grape wine or a grape jelly. If it was a jelly, it has no right to a place among the wines of the Bible. But if it was a wine, and if it was boiled with the object of destroying the alcoholic ferment—unavoidably present in the expressed juice, and thereby preserving it unfermented—the boiled liquor must either have been left to cool in the cauldron before bottling, or it must have been poured into the goatskin bottles while hot. In the former case, the exposure to the air during the cooling process would inevitably re-introduce into the exposed liquor the germs of oxygen, which necessitate fermentation. In the latter case, the boiling juice would inevitably dissolve the pitch with which the goatskin bottles were lined to exclude the air, and thereby render its preservation as an unfermented liquor impossible."

Supposing for a moment that all the assertions regarding what Mr. Wilson is pleased to call "jelly" are true, as well as the inaccuracy as to the alcoholic ferment *necessitating* fermentation, let us confine our attention to what Mr. Wilson says about sobhe as a wine. He says the preservation of the boiled juice as an "unfermented liquor" is impossible.

It may be very wrong of me to drink the impossible, but this morning, and every morning for the last three weeks, I have drank of a most pleasing and refreshing liquor, cheering to the heart and nourishing to the body, as thin as any full-bodied Tokay, four years and a-half old—the pure juice of the grape boiled. It was imported in casks from the East, and after undergoing the great heat of a prolonged voyage on the Mediterranean, was poured into Winchester quarts, the corks being sealed as those of whisky jars generally are. A month ago the liquor, after being carefully examined and found absolutely free from alcohol, was decanted, and though it has been kept in common wine bottles, it has shown no appearance of fermenting; there is no ferment in it to set up fermentation; it has neither, while boiling, dissolved the antiseptic lining of goatskins, nor cracked the glass that encloses it, for it was poured into the bottles while COOL.

Need I add more? And yet, I must. The name of this impossible, aged, unfermented, unintoxicating liquor in one Eastern language at this very hour means WINE!

Thus, then, even though Mr. Wilson's lengthened argument against boiled grape juice being properly denominated "wine," inasmuch as it is a solid to be eaten and not a liquid to be drank, be deemed irrefragable, a pleasant and grateful beverage remains, to which this reasoning is totally inapplicable. There is a liquid resulting from the boiling, as well as a solid; but this liquid, called "wine" in many narratives of Eastern travel which I have had occasion to read in the course of this inquiry, he altogether ignores.

This wine, unfermented, unintoxicating, and liquid, I have again and again myself prepared by boiling, and I have never found the slightest difficulty in preserving it. Such a potable wine, over and above the grape jelly, which seems to be the *bête noir* of Mr. Wilson's existence, was to be bought of Greek fruiterers a few years ago in one of our great cities; and I am glad to find that the judgment I had formed, that this wine improves by age, is confirmed by the universal testimony of all the Orientals whom it has been my good fortune to meet.

To any who, from practical unacquaintance with the various processes of wine manufacture, may fancy that the application of heat alters the quality or impairs the properties of wine, let me quote the deliverance of M. Pasteur, as given by Griffin in the Chemistry of Wines and Spirits: "So far from any mischief occurring, quite the contrary takes place. The wine has more bouquet, greater freshness in taste, and even a more beautiful color than it had before it was heated. It loses no force, but becomes more robust, for after undergoing the heat, it may be exposed to the air in an open bottle without suffering deterioration. The process is applicable to all wines, white or red, strong or delicate, new wines or aged wines" (p. 127).

FUTILITY OF THE ATTACK ON DR. F. R. LEES.

The belief seems to find expression on nearly every page of Mr. Wilson's work that, if Dr. Lees can be discredited, the whole argument in favor of the inclusion of unintoxicating liquors amongst the wines mentioned in the Bible will at once collapse. But

the book has come too late for this. There was a time when the erudite and redoubtable doctor stood alone, but that time has gone by forever.

My valued friend, one of the most illustrious Hebraists of this century, the late Professor Weir, told me, twenty years ago, after presiding at a lecture delivered by Dr. Lees to the university of which the learned professor was so distinguished an ornament, that he was convinced of the soundness of most of the doctor's views on the wines of the Bible; and these views have been, with a few unimportant exceptions, adopted by such scholars as Professors Douglas, Eadie, Fairbairn, Tayler Lewis, and Moses Stuart, such well-known writers as Smith, Valpy, French, Mearns, Ritchie, Burns, and the Dean of Capeton, and most continental authorities on lexicography.

Few have differed from Dr. Lees more than I have, and with some of his conclusions on the drinks of Scripture I can not yet agree; but to his extensive research, the accuracy and ripeness of his scholarship, and the clearness and cogency of his reasoning, I can not refrain from paying a willing, though humble tribute. To him, beyond all others, is due the credit of having first formulated and advocated nearly all the propositions with regard to the influence of alcoholic beverages on the human frame which have found general acceptance in chemical and medical circles; all of his positions on the scientific basis of abstinence being now adopted by the most learned in the land. And, as the longer I study God's Word in the original the nearer do I find myself compelled to approximate to his interpretation, I am almost forced to conclude that his solution of the Bible wine problem may yet

meet with as general acquiescence as has been accorded to his exposition of the chemistry, physiology, and pathology of alcohol.

NATURAL UNFERMENTED WINE NOW IN USE.

In many parts of France *vin boueux* (muddy wine), commonly called *vin bourru*, is drunk by the peasantry like milk: muddy, not from fermentation, but simply from the pulp and seeds being mixed with the juice, the skins being strained off. This wine remains, in ordinary weather, unfermented and non-alcoholic for from twenty to fifty hours, and is evidently the wine described by Philip Miller, F.R.S., in 1768, in these words: "Vin-bourra, as they call it (*i. e.*, a new and sweet wine that has not worked), which they sell while it is quite hot" (Gard. Dict., 8th ed., Art. Vitis).

There is no difficulty in heating fresh grape juice to 180° Fah. and upwards, pouring it into bottles while hot or considerably cooled, and then corking these if made of glass or other solid material, or tying the necks closely if made of the skin of animals. By this means the Ancients could have effectually prevented fermentation, and thus prepared an unfermented, unintoxicating wine with practically unlimited powers of keeping.

Nothing could be more admirably adapted for the preservation of such generous and nourishing wine, than were the leather or dried skin bottles in general use throughout the East in both ancient and in modern times, and the pitching of the "leather bottèl" (Old English song, 1682) with mineral tarry substances would, by the consequent exclusion of air and water and the antiseptic action, greatly increase the

preservative qualities of the vessels. Wine so prepared and so preserved would never ferment.

I have, time and again, examined grape juice hours after, by the interference of man, it has been expressed, and found not a trace of alcohol; and I have, by repeated experiment, proved that nothing can be easier than the production and preservation of unfermented wine. The preparation of this nutritious and cheering non-alcoholic drink is as speedy, simple, and easy as the manufacture of alcoholic liquor is tedious, complex, and difficult.

CONCLUSION.

Our author says the argument of his book is cumulative, and he wishes this cumulative argument to be dealt with as a whole. His argument appears to me to be this:—Grape juice begins to ferment immediately on exposure to the air; therefore, unless the Ancients boiled the juice, they could not have preserved it unfermented; and as the juice was boiled down to the consistence of a jelly, a solid to be eaten and not a liquid to be drank, the existence of unfermented wine among the Ancients was a myth.

I have shown in reply—

That grape juice does *not* begin to ferment immediately on exposure to the air;

That a period varying from some hours to several days elapses before the process of fermentation and the formation of alcohol begin;

And that during this intermediate unfermented stage simple measures could be adopted to prevent fermentation.

I have shown that over and above the dibs, or honey of grapes (a substance which, with the addition of as much water as had previously been driven off by heat, formed a favorite and refreshing unfermented drink), resulting from the boiling of the juice, there is a liquid product, in common use by modern Turks and in many parts of the East to this day, and which, either alone or diluted with water, makes a palatable, grateful, and cheering beverage.

And I have also shown—

That, apart from boiling, the blood of the grape can be preserved, unfermented and free from alcohol, by many simple processes, most of which could have been as easily adopted by the Ancients as by us;

And that, in fact, such unintoxicating wines, directions for the preparation of which are still extant, were, as well as fermented and intoxicating beverages, indulged in in the days of old.

Therefore, it is as clear as is the light of the sun at noon, that the existence of unfermented and unintoxicating wine amongst both Ancients and Moderns, is not a myth, but A FACT.

WINE AND ITS USE.

We present the following extracts from the little book entitled "Holy Scripture and Temperance," by Canon Hopkins.

"It seems to have become an almost universal habit to take for granted that whenever *wine* is mentioned in Holy Writ, an intoxicating drink is intended. Of course, it is well known that *intoxicating* wine is very often spoken of in Holy Scripture, although invariably some cautionary or condemnatory language is appended, whenever its power to produce drunkenness is recognized. This fact creates a presumption that Holy Scripture does not sanction or justify the habitual use of intoxicating wine. But this presumption would be very weak, if it were not supported by any other facts. Is it, then, supported in any other way? Most readers will be ready to dismiss the question at once, and assume as beyond doubt that there is no case whatever against the received notion. Wine is wine,* they will urge, and it is absurd to pretend that it is or can be anything else. There is, however, only one passage in Holy Scripture which gives any insight into the chemical properties of the wine which was then in common use, and this is in the New Testament. Our Lord, speaking of the wine which

* There are at least nine Hebrew words which are translated *wine* in our version; and there are thirteen distinct Hebrew and Greek terms translated by the same word *wine*. See "Smith's Dictionary of the Bible," Art. *Wine;* and "*The Bible Wine Question*," p. 11. *Dr. F. R. Lees.*

was in use at the period when He lived and taught, says on one occasion:

"'No man putteth new wine into old bottles; else the new wine will burst the bottles, and be spilled, and the bottles shall perish. But new wine must be put into new bottles; and both are preserved. No man also having drunk old wine, straightway desireth new; for he saith, The old is better.' *

"Three properties of wine are here spoken of; and spoken of as being perfectly familiar to the experience of all persons who have anything to do with wine:

"1. New wine put into new bottles will keep without danger either to the wine or to the bottles.

"2. New wine put into old bottles will not keep, but will in some way burst and destroy the bottles, and will run out and be spilled.

"3. The wine is mellowed by being kept, and acquires by age a more attractive flavor.

"Where, then, can we find a liquid which fulfills these three conditions?

"The answer is not so simple as it seems to be at first sight. The explanation suggests what takes place when a boy first tells his teacher that he does not understand this parable. The boy knows that new wine is put into old bottles; and has never heard that any injury follows either to the bottles or to the wine. The teacher remarks, that the ancients kept their wines in leather bottles (which, by the way, is not strictly correct as a universal fact), and that old leather skins become hardened and will not stand the expansive action of any new wine put within them. The

* St. Luke v. 37-39; compare St. Matt. ix. 17, and St. Mark ii. 22.

pupil knows nothing about leather bottles, nor about the chemical properties of new wine, so he says, 'Oh! indeed! Very true;' and there the matter usually ends. Yet everybody knows very well that modern still wine, whether new or old, may be put with perfect security into any kind of bottle whatever, and has no tendency to burst the bottle, and will not be spilled or run out, unless some one uncorks the bottle and pours out the wine.

"So, too, distilled ardent spirit, however new, or new wine manufactured out of spirits and water with coloring and flavoring, ingredients added, may be put into old leather bottles with perfect safety. The spirit would rather tend to preserve than destroy the bottles.

"Sparkling wines could not be safely put into leather bottles at all, either new or old. Even with thick glass bottles, there is a great destruction of bottles and loss of wine in the factories where these wines are made and prepared for the market.

"It seems, then, that the wine referred to by our Lord must have possessed chemical properties very different from those of modern wines. Wines in which the fermentation has ceased, still wines, have no properties remaining in them which would render it unsafe to put them into any bottles, new or old, which are sound and fitted to receive them. Such wines have no tendency to burst bottles. The other kind of wines, sparkling or effervescing wines, are not fit to be put into leather bottles at all. The carbonic acid gas with which they are charged would distend and crack the leather or burst open the seams.

"What, then, was this wine which would be safely

preserved in new bottles, but would ferment and cause old bottles to burst? The only answer is, that it was wine, the juice of the grape, which was as yet *unfermented*, and contained no alcohol whatever!

"It is well known that extensive wine-growers keep tons of unfermented grape juice, and some of it for as long as ten years. It is well known that the ancients kept unfermented grape juice, preserved in its sweet state, for a full year, and called it ἀεὶ γλεῦκος or *semper mustum*. It is a fact that at this very day, both in France and in the East, unfermented wine is made, and drunk, and sometimes kept for months or years. It is also a fact that to those who drink it the flavor appears to become more mellowed and grateful by the influence of time; so that no one who drinks this old wine straightway desires new, for he says, THE OLD IS BETTER."

"In this wine, this ἀεὶ γλεῦκος, in this *must* is found a liquid which perfectly fulfills the three conditions which are demanded by the terms of our Lord's parable.

"1. If this wine, properly prepared, be put into new bottles, it will keep for any length of time without fermenting. The ἀσκοὶ, or 'utres,' were bags made of goat-skin, and smeared with pitch within and without to make the seams water-tight. The pitch itself was a safeguard against fermentation, and the wine and the bottles could be kept without danger.

"2. If, however, this prepared must be put into a leather skin which has before contained wine, fermentation will necessarily ensue. Minute portions of albuminoid matter would be left adhering to the

skins, and receive yeast germs from the air, and keep them in readiness to set up fermentation in the new unfermented contents of the skin. Moreover, an old 'bottle' might have been used to contain other things as well as wine; and so would be in many ways liable to collect the germs of the *torula*, which would be the latent causes of its future destruction. For as soon as the unfermented grape juice was introduced, the yeast germs would begin to grow in the sugar and to develop carbonic dioxide. If the must contained one-fifth sugar, it would develop forty-seven times its volume of the gas, and produce a pressure of 34.3 atmospheres, *i.e.*, 1,300 lbs. to the square inch, about ten times the pressure which an ordinary high-pressure steam-engine has to withstand. No leathern bottle, new or old, could endure this enormous tension! The bottle would burst and the wine would be spilled.

"3. The must properly enclosed and kept, improves in quality and flavor. It is used by modern Turks in many parts of the East to this day; and either alone or diluted with water makes a palatable, grateful, and cheering beverage. The same wine has been imported into England in casks. Non-alcoholic wine has been largely and successfully prescribed for fever, consumption, and dyspepsia, from some form of which latter malady Timothy may have been suffering when St. Paul recommended him to 'drink no longer water,' but to 'use a little wine.'

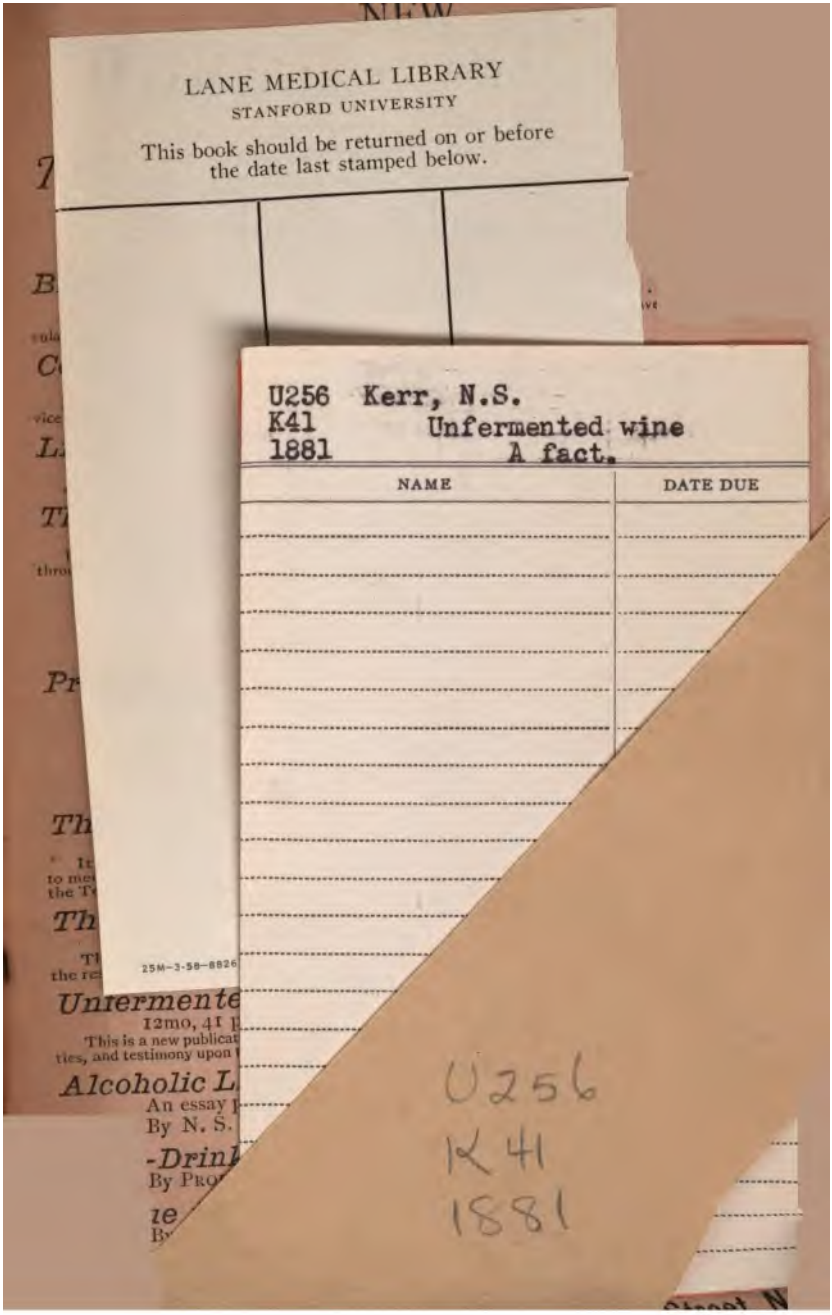
"Let the reader observe that it is not here asserted that this must *was* the wine to which our Lord referred. It would be halting logic to argue that because the liquid *may* have been must, therefore it

was must. *May* must not be confounded with *must.* Here, however, is a wine which entirely fulfills the three conditions necessary to make our Lord's parable really pertinent and applicable to the lesson He was teaching at the time. In the absence of any direct evidence that the wine He refers to was *must,* or that *must* was usually kept in leathern bottles, the argument only amounts to a *presumption.* But the presumption becomes very strong, and approaches very nearly to certainty, unless some other liquid also called *wine* can be identified as possessing the three properties mentioned above. Until this is done, a candid inquirer will feel that a case (bordering closely upon actual demonstration) has been made out; and that he is almost driven to conclude that the wine, which was present to the mind of Jesus when He thus spoke, and which was familiar to the experience of all to whom He was then speaking, was unfermented and non-intoxicating wine."

"It must always be insisted upon, and it ought always to be remembered, that 'wine' in Holy Scripture is a general and an inclusive term. It is manifest that *some wine* mentioned in Holy Scripture was intoxicating; but it is certain the word *wine* is also used for the fresh unfermented juice of the grape, and for the must or sweet wine or new wine which was *not* intoxicating. It is, perhaps, *possible* (to take the lowest ground) that the commendations of Holy Scripture ought to be limited to the non-intoxicating wine, whilst its warnings and denunciations are launched against intoxicating wine. The fruit of the vine and the juice of the grape are symbols of heaven-

ly blessings; the fiery cup which results from fermentation is the type of the fierce wrath of God!

"When we compare the two assertions, 'Wine is a mocker,' and 'Wine maketh glad the heart of man,' it is scarcely possible to believe that the word '*wine*' means the same identical thing in both sentences. Yet it seems to be generally assumed that it does. Why should such an assumption be made without any attempt at proof? Is it usual for any accurate writer to employ a word in this way, unless he is aware, and his readers are aware, that the word is in fact used to describe two different things? Much less is it to be thought that holy men of God, who spake as they were moved by the Holy Ghost, could speak otherwise than accurately. Now, the juice of the grape in its natural state is wholesome and nutritive. It is a cordial and a tonic. But after fermentation it loses most, if not all, its nutritious qualities, and is indeed a 'mocker.' It is pleasant to the taste, refreshing at first to the spirits, but very soon 'it bites like a serpent and stings like an adder.' The real question is very simple. It is a question of fact. Is the word 'wine' used in Holy Scripture as the name of both these liquids? That it is so used no impartial inquirer can justly deny."



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